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**LOCKHEED MARTIN**



Via Facsimile & U. S. Mail  
RED0300/025 WBS 48

March 15, 2000

Mr. Gerald J. Thibeault  
Executive Officer  
California Regional Water Quality Control Board  
Santa Ana Region  
3737 Main Street, Suite 500  
Riverside, California 92501-3339

**Subject: Quarterly Report – December 1999 through February 2000  
Cleanup and Abatement Order No. 97-58  
Lockheed Martin Corporation**

Dear Mr. Thibeault:

This Report covers activity for the months of December 1999, January and February 2000. The report is submitted in accordance with Board Order No. 97-58 and the approved 15 August 1997 Work Plan and Schedule.

## **1.0 Perchlorate Sampling**

Technical data on perchlorate, associated with the regular Water Supply Contingency Policy sampling, was submitted in monthly format to the RWQCB under separate cover. The reports are entitled, "Production Well Sampling Report, Water Supply Contingency Plan, Crafton-Redlands Plume Project."

## **2.0 Modeling of Perchlorate Migration and Potential Impacts**

Updated forecasts of perchlorate concentrations are now anticipated to be completed during the second quarter of 2000. The revised numerical model will incorporate updates to basin hydrostratigraphy, plume initial conditions, and projections of flow for various new and existing Bunker Hill Basin wells.

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### **3.0 Treatment Technology Applicability Review**

This update presents recent developments in treatment technology research.

#### **3.1 Perchlorate Treatment Technology Update**

This update is divided into two parts: on-going research efforts sponsored by Lockheed Martin, and highlights of research efforts by other groups such as technology companies, public agencies and universities.

##### **3.1.1 Testing Sponsored by Lockheed Martin**

Lockheed Martin is continuing to conduct research on various ion exchange process options. This research includes field tests recently begun at a Gage Canal Company well (known as "Gage New 6") of different resins that could be used in a fixed bed treatment approach.

##### **3.1.2 Testing Sponsored by Other Groups**

###### **Pilot Tests of the Calgon ISEP System**

Calgon has a contract with the La Puente Valley County Water District to operate a 2,500 gpm ISEP system to remove perchlorate from a water supply well with 50 ppb to 100 ppb perchlorate concentrations. Treated water from the full-scale system is being discharged to spreading basins for an extended period of time until the Department of Health Services grants a permit and allows the treated water to be distributed into a drinking water system.

###### **Biological Treatment Testing Sponsored by Aerojet**

Aerojet is negotiating with the City of La Puente to pilot test the biological treatment process at this site. This work is being done in conjunction with the Baldwin Park Operable Unit Steering Committee and the Main San Gabriel Basin Watermaster. Please note that additional process steps would be required following the biological process in applications where the treated water is used directly for drinking water. These processes could include multi-media filters and granular activated carbon.

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## **American Water Works Association Research Foundation (AWWARF) - Perchlorate Research Projects**

Eight perchlorate related research contracts were awarded by AWWARF in 1998. The research includes investigation of perchlorate removal/destruction by biological means, ion exchange, reverse osmosis and nanofiltration. Seven of the eight research teams are scheduled to complete their work in 2001, with one team to complete their work this year. Background information on these studies is posted by AWWARF at their website: <http://www.awwarf.com/>.

### **4.0 Water Supply Contingency Options**

#### **4.1 City of Riverside**

The City of Riverside continues to blend perchlorate to levels below the provisional action level.

#### **4.2 City of Loma Linda**

Lockheed Martin is in the process of installing up to three new production wells for the City of Loma Linda to avoid the perchlorate plume. Each new well is intended to replace a well that has been or will be abandoned as a result of impacts from the perchlorate plume.

The first well, designated as COLL Mountain View #3, is located on the same City property as former COLL Mountain View #1 production well (now abandoned). Mountain View #3 has been installed to a total depth of 1,590 feet below ground surface (ft-bgs), and has been equipped for temporary use with the refurbished pump that was removed from Mountain View #1. This well has an off-specification annular seal at depth; thus, we are planning to replace the well. A permit application for use of the well was submitted to the California Department of Health Services (DHS) and was conditionally approved on October 28, 1999. Mountain View #3 began pumping to the COLL water distribution system on November 2, 1999. While the effectiveness of the annular seal is suspect, this well continues to be non-detect for perchlorate and TCE.

The second of the new production wells is designated as COLL Richardson #4 and is located on Gould Street approximately 400 feet west of Richardson Street on property currently owned by the City of San Bernardino. Transfer of this property to the COLL is in progress. Richardson #4 has been installed to a total depth of 1,475 ft-bgs and has undergone mechanical development. As of the end of this reporting period, the development of Richardson #4 is complete and LMC is preparing to outfit this well with temporary pumping equipment for use this summer.

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The third new production well, known as Mountain View #4, has been installed and developed. The new well is located at the southwest corner of the intersection of the Interstate 10 Freeway and Mountain View Avenue. This well will be pump tested, then equipped with temporary pumping equipment for use later this year.

A fourth new production well, to be known as Mountain View #5, will be installed later this year to replace the off-specification Mountain View #3 well. Mountain View #3 may or may not be retained as a backup supply well.

Lockheed Martin continues to support the City of Loma Linda staff in modifying blending plans to keep the perchlorate concentration below the provisional action level. COLL Mountain View #2 production well has been operating under a blending plan since November 1998. The previously existing Richardson #2 well was destroyed in February.

Connections to the adjacent water distribution systems of the City of Redlands (Cored) and Loma Linda University (LLU) are being pursued as contingency water supply sources, should the COLL system be unable to meet peak water demand before the new production wells come online. A connection to the City of San Bernardino (COSB) water system already exists and COLL and COSB have a water transfer agreement. A connection to LLU also currently exists. However, sampling and analysis of the LLU wells was required, and performed, as part of the application to the DHS to allow the water transfer to occur. The DHS approved the application on September 3, 1999, to allow the connection to be flow tested. For operational reasons, that flow test was not been performed as of the end of this reporting period, but is planned to occur soon. If the flow test of the connection is successful, a water transfer agreement between the COLL and LLU will be negotiated. Construction has completed on the connection to the Cored water system during this reporting period. This connection design was previously approved by the technical staff of the COLL and the Cored. Also, the City Councils of COLL and Cored have approved the connection construction and have negotiated and approved a water transfer agreement.

#### **4.3 Victoria Farms**

Lockheed Martin continues to negotiate with Victoria Farms to resolve issues relating to the draft (July 1997) Water Supply Contingency Agreement. Victoria Farms currently receives water from the City of San Bernardino under a temporary water supply agreement. Lockheed Martin is reimbursing Victoria Farms for the incremental cost of the imported water.

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#### **4.4 City of Redlands**

The City of Redlands is avoiding perchlorate through the active management of their surface water and groundwater resources. In 1999, Lockheed Martin and the City of Redlands came to terms on past TCE and perchlorate response costs submitted by the City of Redlands.

#### **4.5 Mountain View Power Company (formerly Southern California Edison)**

No perchlorate has been detected in the Mountain View Power Company wells. The Mountain View Power Company plans to increase pumping at wells SCE Nos. 1 and 2 for cooling water purposes.

#### **4.6 Loma Linda University**

No Perchlorate was detected above the provisional action level in the Loma Linda University wells.

#### **5.0 Perchlorate Study Group**

The Perchlorate Study Group (PSG) continues to provide financial support for ongoing toxicology research on perchlorate. As they are completed, the results of these studies are being forwarded to the Interagency Perchlorate Steering Committee, which includes members from the U.S. EPA and California EPA.

In cooperation with the PSG, the U.S. EPA, and the United States Air Force, Lockheed Martin has coordinated a multiple lab test of numerous chemical fertilizers for the presence of perchlorate in 1999. The USAF is taking the lead in the publishing of this report.

We understand that the U.S. EPA's draft "Reference Dose" (RfD) for perchlorate (published in December 1998) will be assessed in a second external peer review sometime in the fall of 2000. The U.S. EPA is currently expecting toxicological results from several new studies to determine if the draft RfD (equivalent to 32 ppb in water) should be finalized or revised.

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## 6.0 Closing

The next quarterly update will be submitted on or about June 15, 2000. If you have any questions, please contact me at (818) 847-0791.

Sincerely,

A handwritten signature in cursive script, appearing to read "Thomas D. Blackman", with a long horizontal flourish extending to the right.

Thomas D. Blackman  
Technical Project Manager

cc: See attached distribution list

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